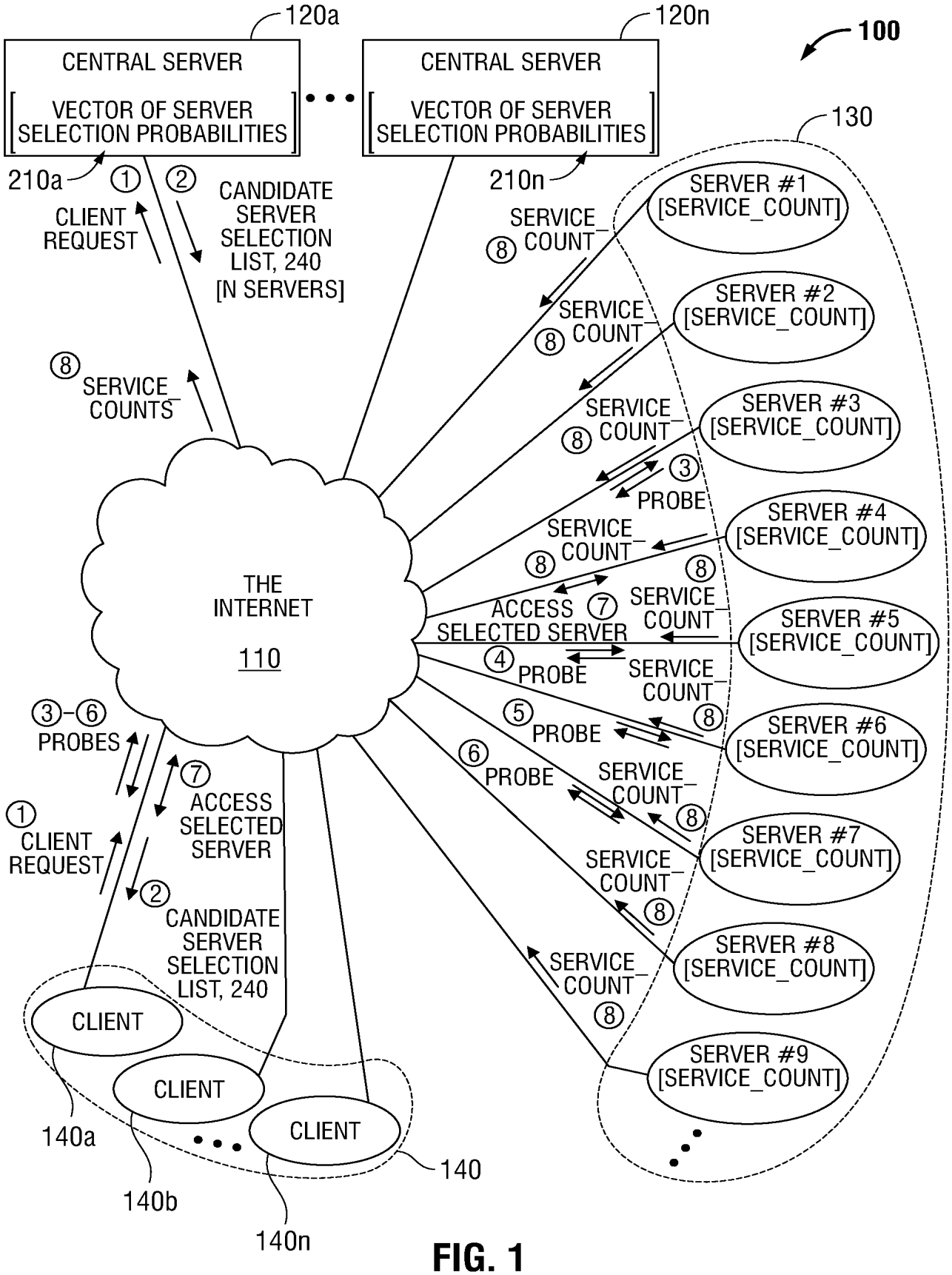

120a
120n
100
CENTRAL SERVER
VECTOR OF SERVER SELECTION PROBABILITIES
CENTRAL SERVER
VECTOR OF SERVER SELECTION PROBABILITIES
130
210a
210n
1
CLIENT REQUEST
2
CANDIDATE SERVER SELECTION LIST, 240 [N SERVERS]
8
SERVICE_ COUNTS
8
SERVICE_ COUNT
SERVER #1 [SERVICE_COUNT]
SERVER #2 [SERVICE_COUNT]
SERVER #3 [SERVICE_COUNT]
SERVER #4 [SERVICE_COUNT]
SERVER #5 [SERVICE_COUNT]
SERVER #6 [SERVICE_COUNT]
SERVER #7 [SERVICE_COUNT]
SERVER #8 [SERVICE_COUNT]
SERVER #9 [SERVICE_COUNT]
3
PROBE
THE INTERNET
110
ACCESS SELECTED SERVER
7
4
PROBE
5
PROBE
6
PROBE
3-6
PROBES
7
ACCESS SELECTED SERVER
1
CLIENT REQUEST
2
CANDIDATE SERVER SELECTION LIST, 240
CLIENT
CLIENT
CLIENT
140a
140b
140n
140

FIG. 1

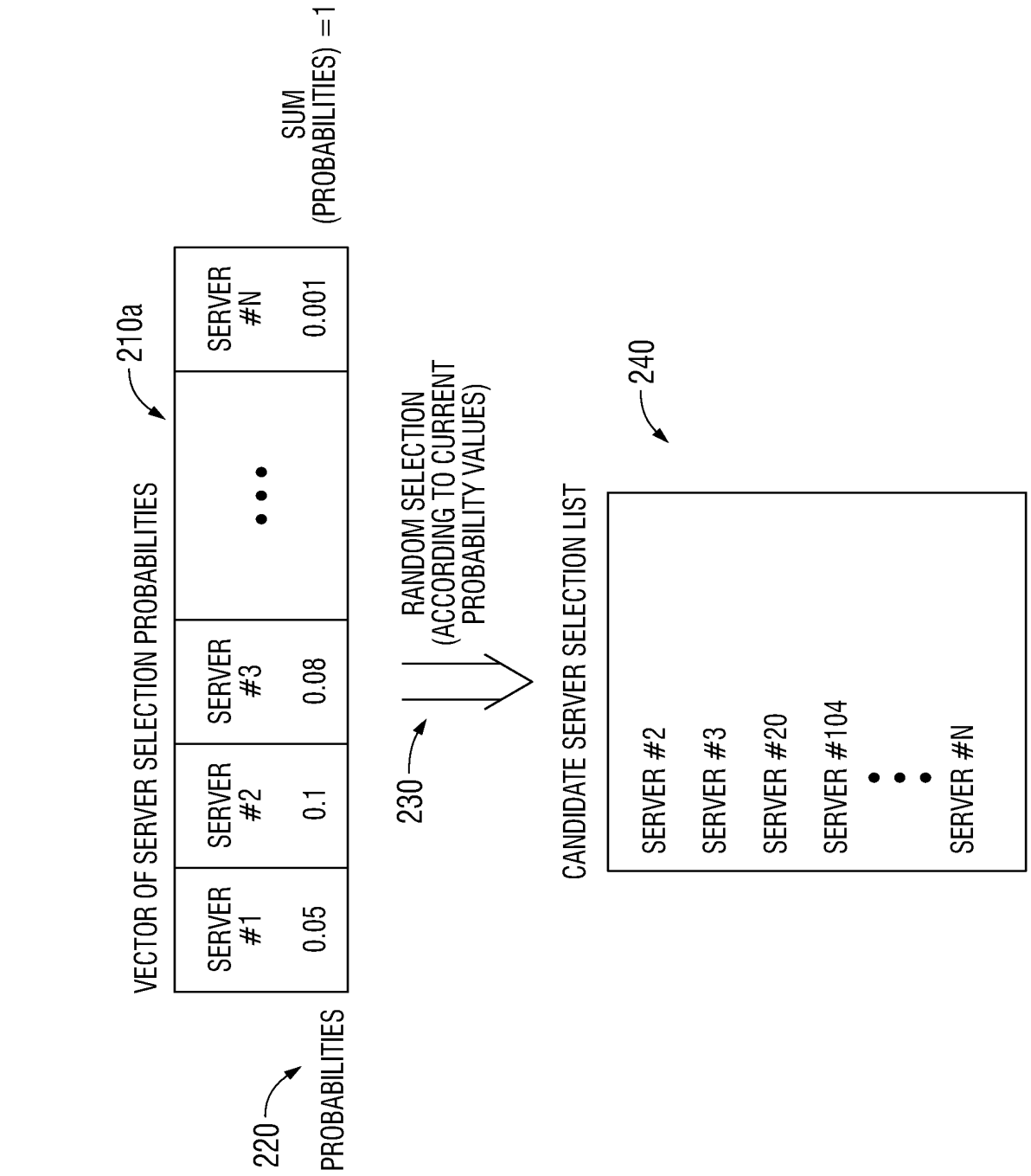

220
PROBABILITIES
VECTOR OF SERVER SELECTION PROBABILITIES
210a
SERVER #1
0.05
SERVER #2
0.1
SERVER #3
0.08
SERVER #N
0.001
SUM (PROBABILITIES) =1
230
RANDOM SELECTION (ACCORDING TO CURRENT PROBABILITY VALUES)
240
CANDIDATE SERVER SELECTION LIST
SERVER #2
SERVER #3
SERVER #20
SERVER #104
SERVER #N

FIG. 2

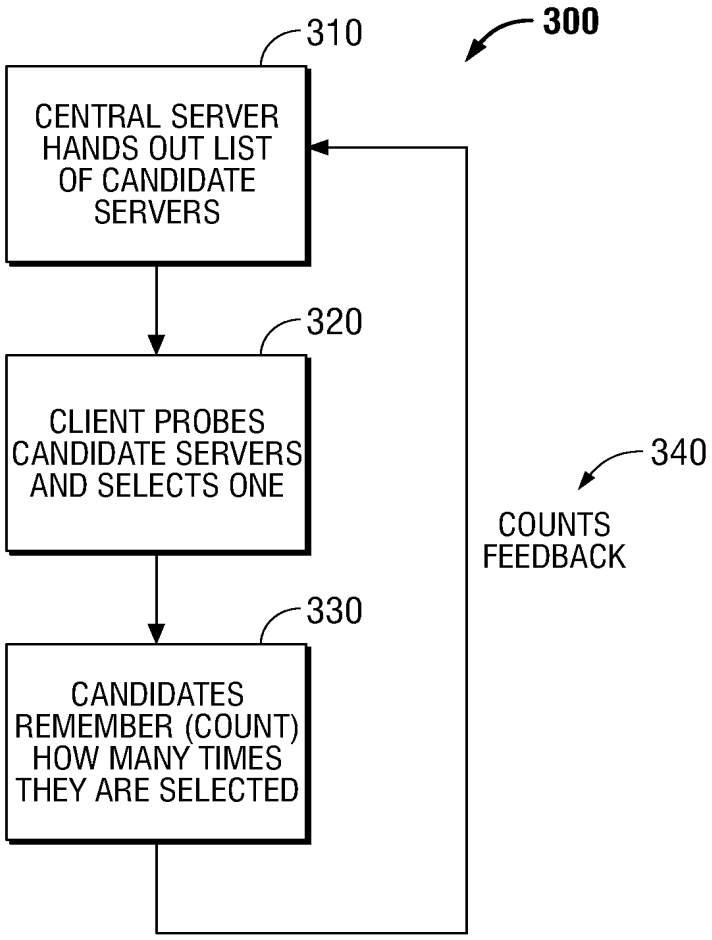

300
310
CENTRAL SERVER HANDS OUT LIST OF CANDIDATE SERVERS
320
CLIENT PROBES CANDIDATE SERVERS AND SELECTS ONE
330
CANDIDATES REMEMBER (COUNT) HOW MANY TIMES THEY ARE SELECTED
340
COUNTS FEEDBACK

FIG. 3

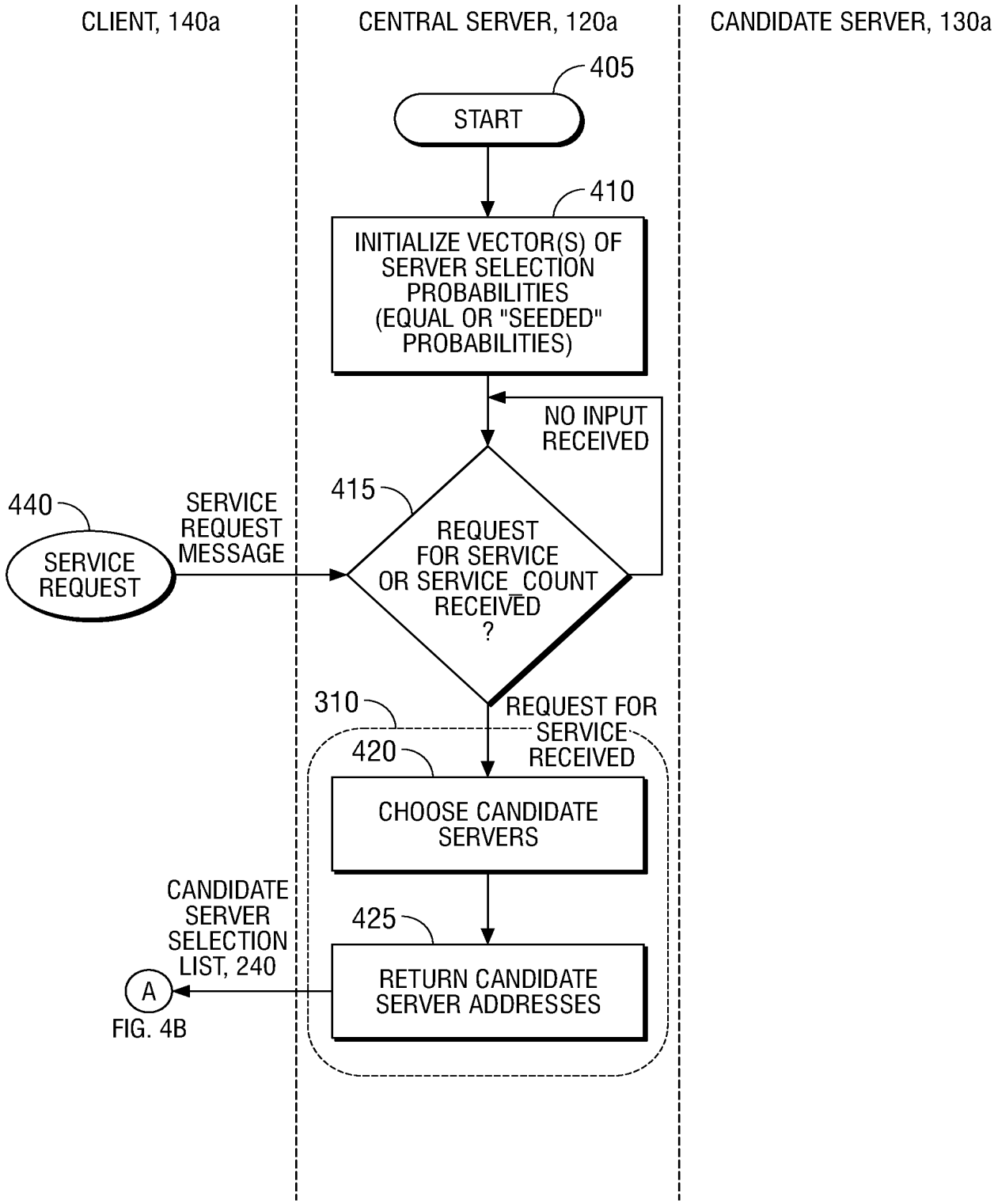

CLIENT, 140a
CENTRAL SERVER, 120a
CANDIDATE SERVER, 130a
405
START
410
INITIALIZE VECTOR(S) OF SERVER SELECTION PROBABILITIES (EQUAL OR "SEEDED" PROBABILITIES)
NO INPUT RECEIVED
415
REQUEST FOR SERVICE OR SERVICE_COUNT RECEIVED ?
440
SERVICE REQUEST
SERVICE REQUEST MESSAGE
310
REQUEST FOR SERVICE RECEIVED
420
CHOOSE CANDIDATE SERVERS
425
RETURN CANDIDATE SERVER ADDRESSES
CANDIDATE SERVER SELECTION LIST, 240
A

FIG. 4B

FIG. 4A

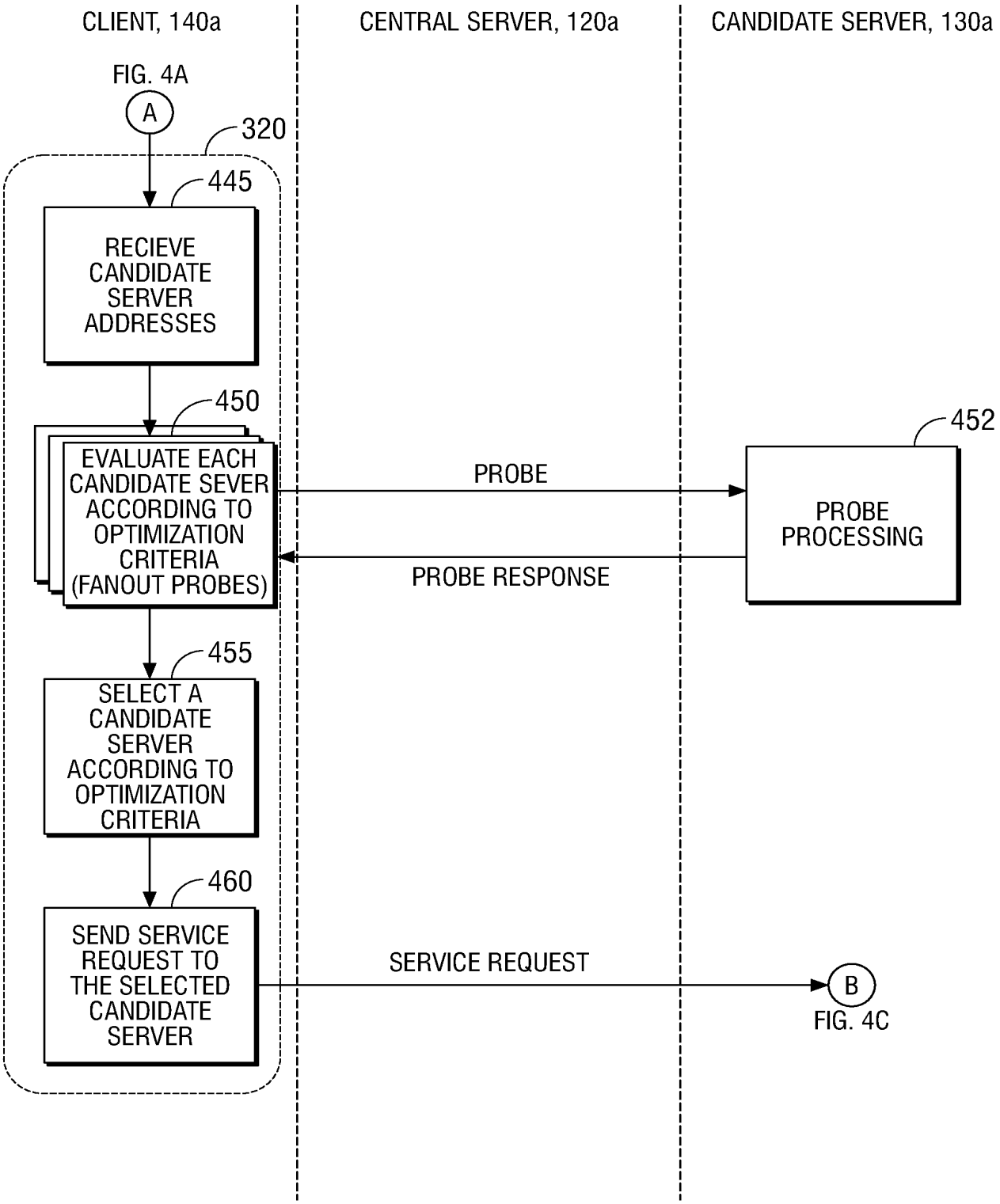

CLIENT, 140a
CENTRAL SERVER, 120a
CANDIDATE SERVER, 130a
FIG. 4A
A
320
445
RECIEVE CANDIDATE SERVER ADDRESSES
450
EVALUATE EACH CANDIDATE SEVER ACCORDING TO OPTIMIZATION CRITERIA (FANOUT PROBES)
PROBE
PROBE RESPONSE
452
PROBE PROCESSING
455
SELECT A CANDIDATE SERVER ACCORDING TO OPTIMIZATION CRITERIA
460
SEND SERVICE REQUEST TO THE SELECTED CANDIDATE SERVER
SERVICE REQUEST
B
FIG. 4C

FIG. 4B

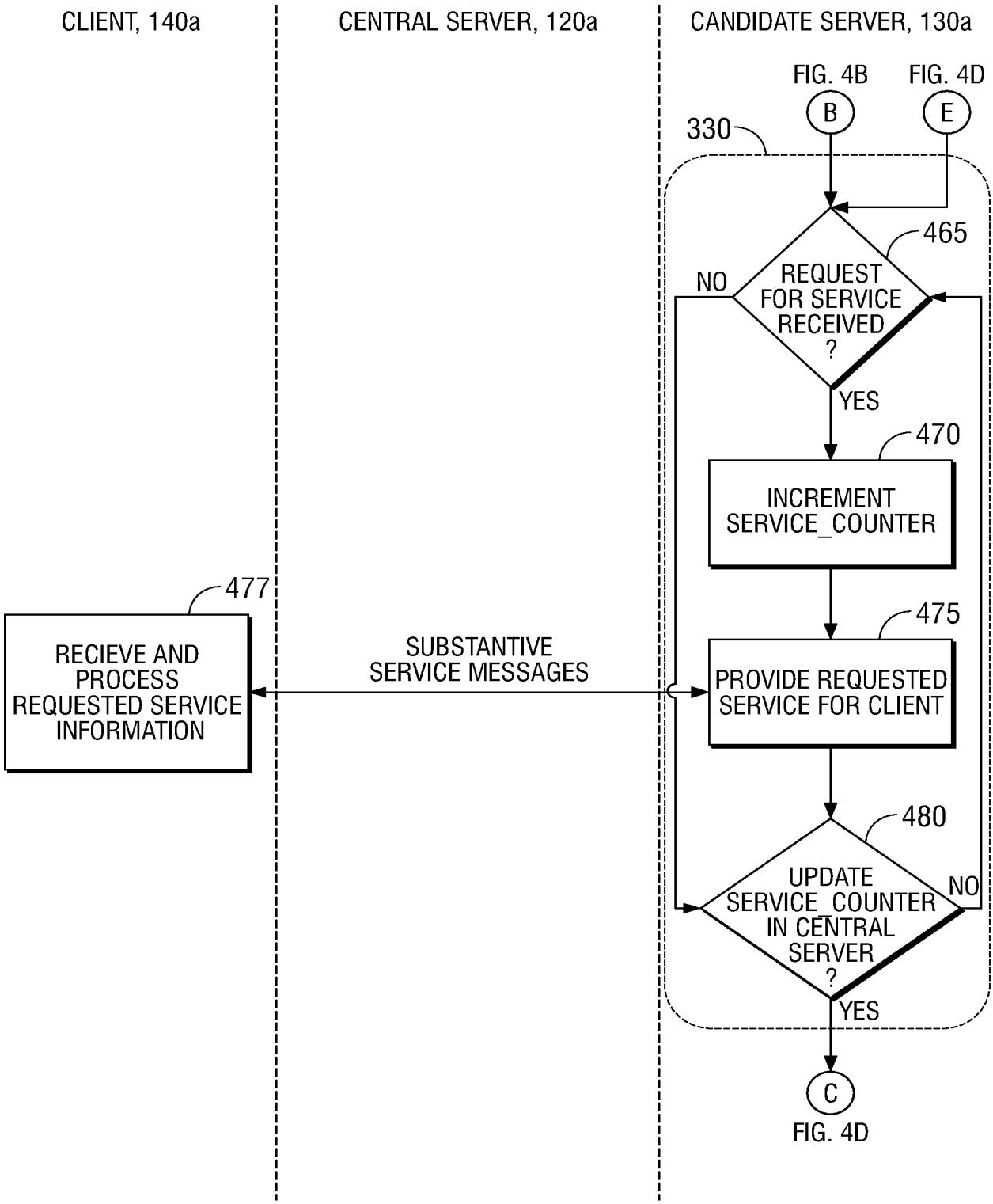

CLIENT, 140a
CENTRAL SERVER, 120a
CANDIDATE SERVER, 130a
FIG. 4B
FIG. 4D
B
E
330
465
REQUEST FOR SERVICE RECEIVED ?
NO
YES
470
INCREMENT SERVICE_COUNTER
475
PROVIDE REQUESTED SERVICE FOR CLIENT
480
UPDATE SERVICE_COUNTER IN CENTRAL SERVER ?
NO
YES
C
FIG. 4D
477
RECIEVE AND PROCESS REQUESTED SERVICE INFORMATION
SUBSTANTIVE SERVICE MESSAGES

FIG. 4C

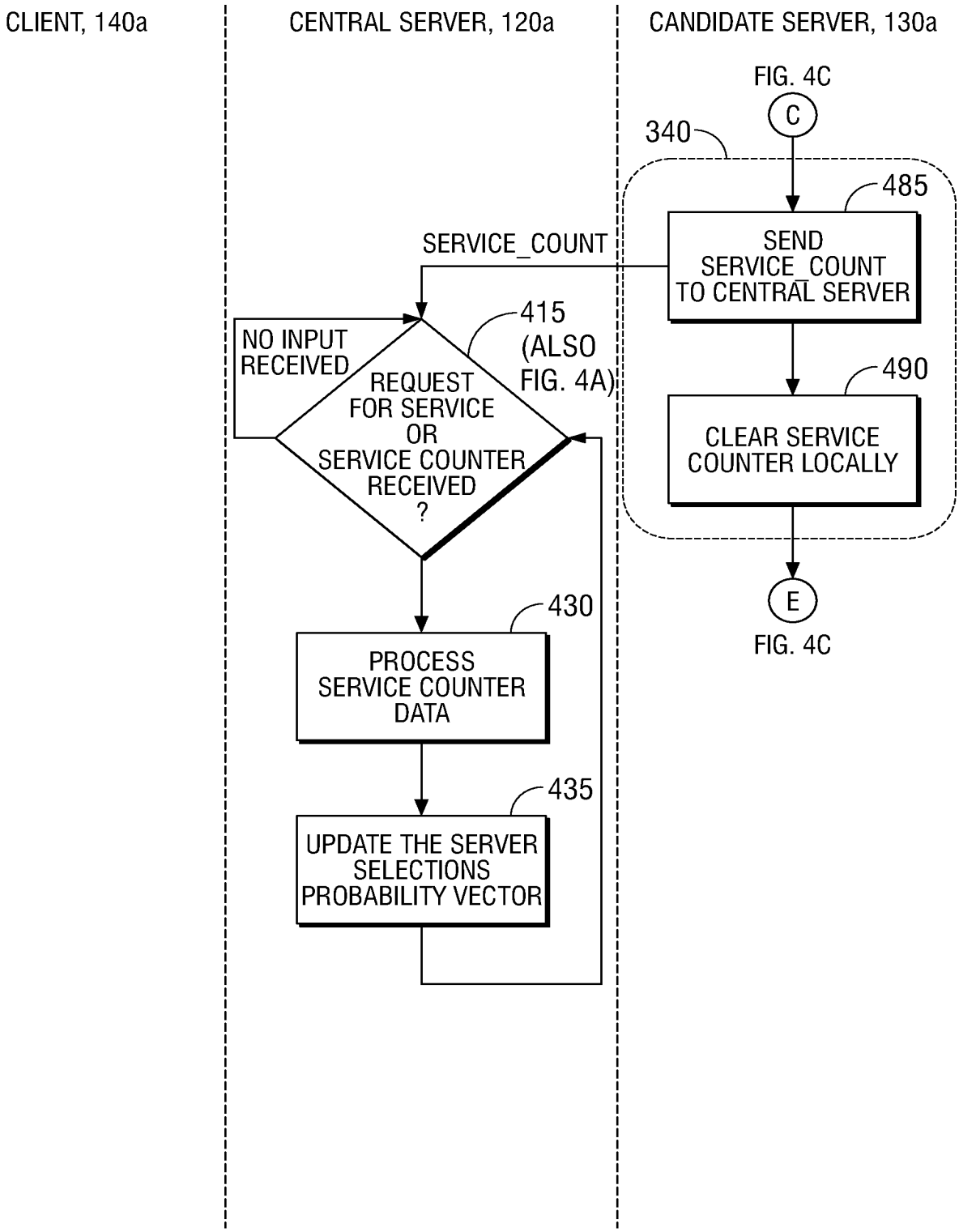

CLIENT, 140a
CENTRAL SERVER, 120a
CANDIDATE SERVER, 130a
FIG. 4C
C
340
485
SEND SERVICE_COUNT TO CENTRAL SERVER
SERVICE_COUNT
415 (ALSO FIG. 4A)
NO INPUT RECEIVED
REQUEST FOR SERVICE OR SERVICE COUNTER RECEIVED ?
490
CLEAR SERVICE COUNTER LOCALLY
E
FIG. 4C
430
PROCESS SERVICE COUNTER DATA
435
UPDATE THE SERVER SELECTIONS PROBABILITY VECTOR

FIG. 4D

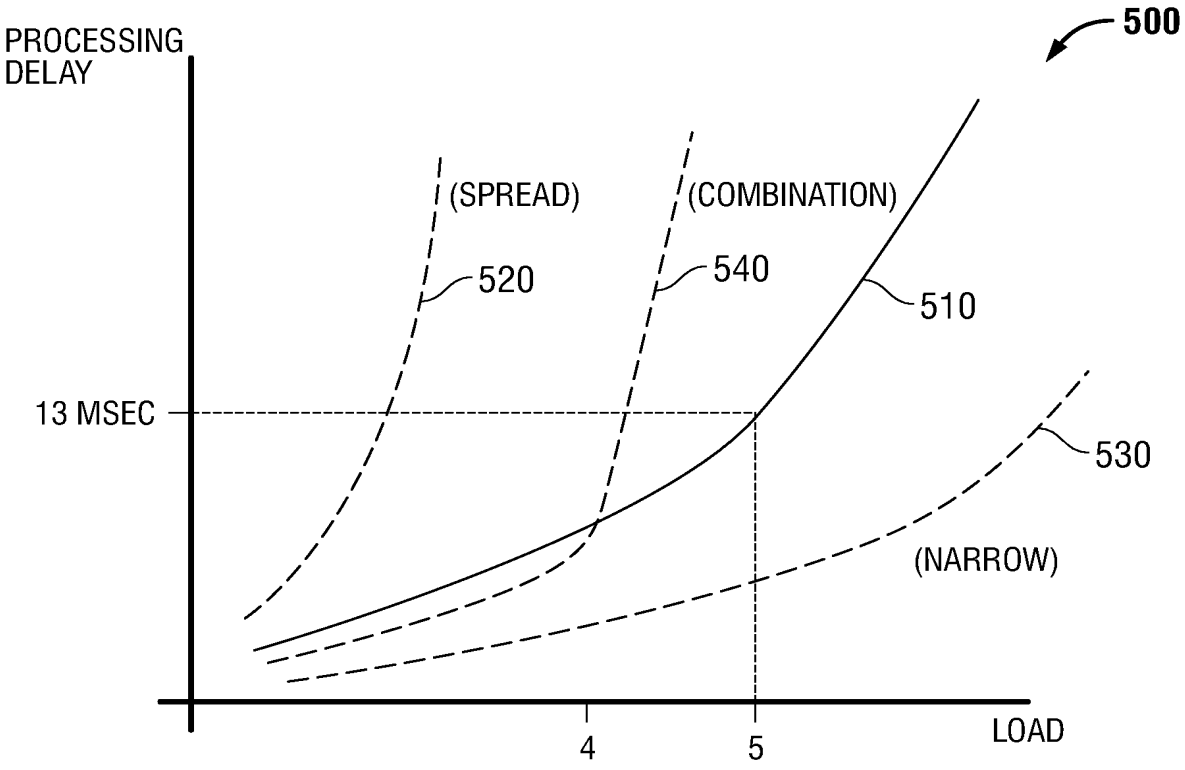

500
PROCESSING DELAY
(SPREAD)
520
(COMBINATION)
540
510
13 MSEC
530
(NARROW)
4
5
LOAD

FIG. 5

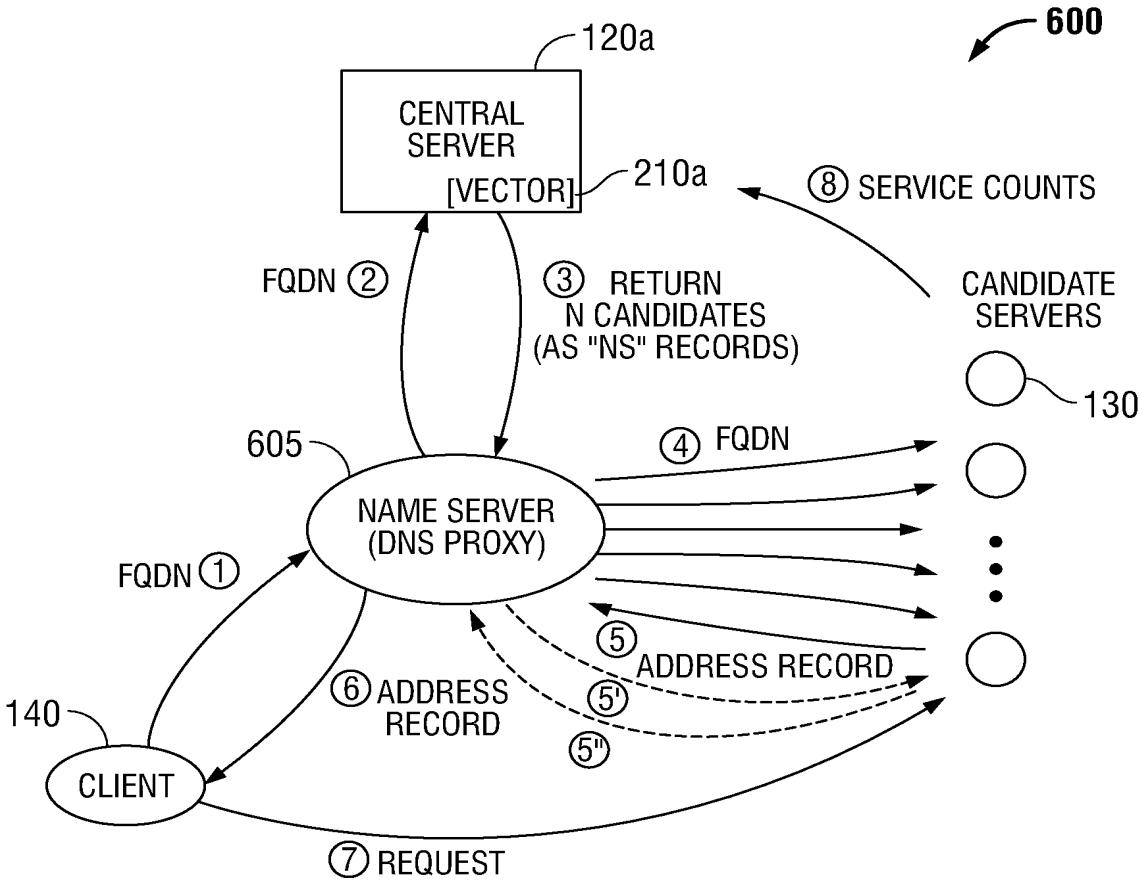

600
120a
CENTRAL SERVER
[VECTOR]
210a
8 SERVICE COUNTS
FQDN 2
3 RETURN N CANDIDATES (AS "NS" RECORDS)
CANDIDATE SERVERS
130
605
4 FQDN
NAME SERVER (DNS PROXY)
FQDN 1
5
ADDRESS RECORD
5'
6 ADDRESS RECORD
5"
140
CLIENT
7 REQUEST

FIG. 6

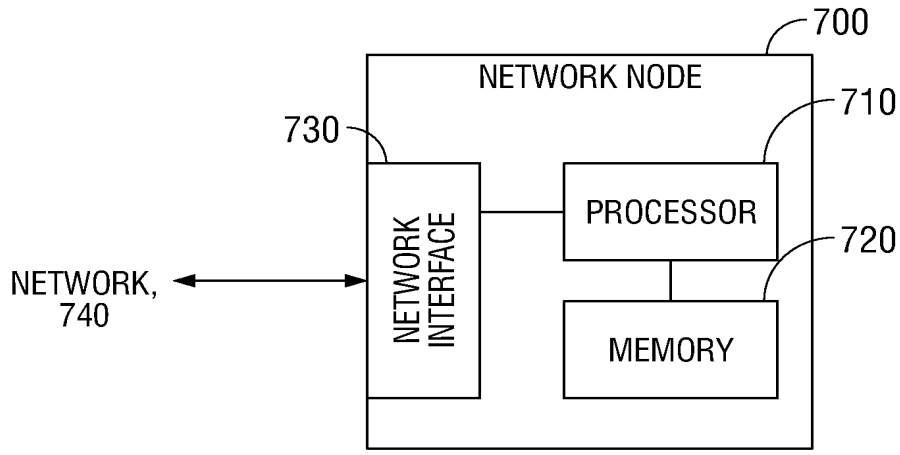
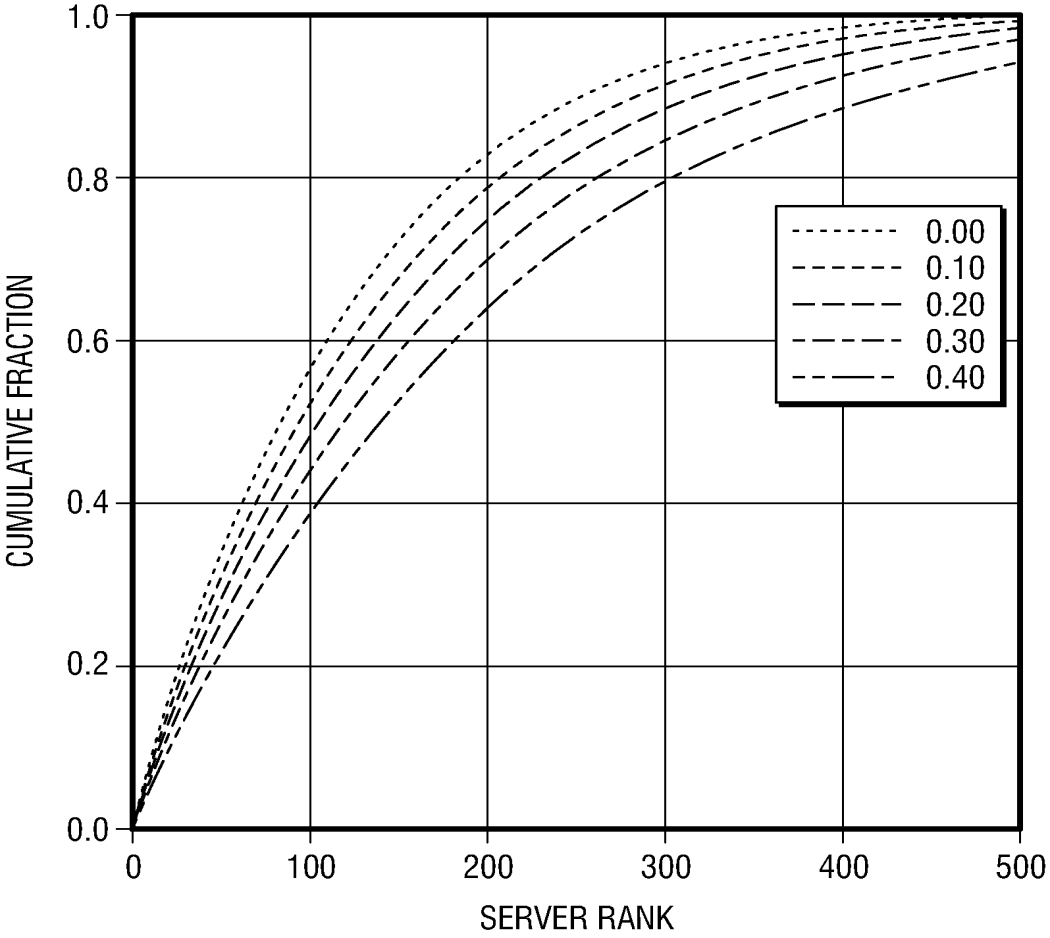
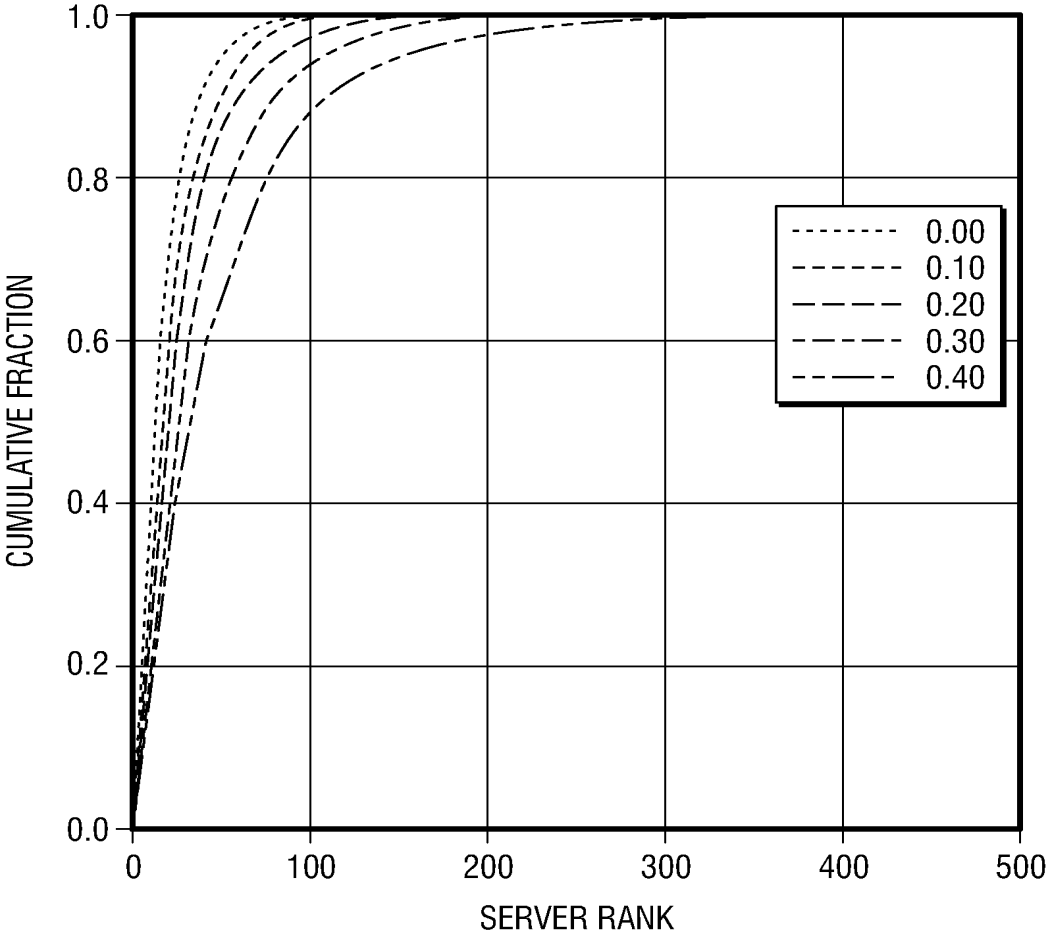

700
NETWORK NODE
730
710
NETWORK INTERFACE
PROCESSOR
720
MEMORY
NETWORK, 740

FIG. 7



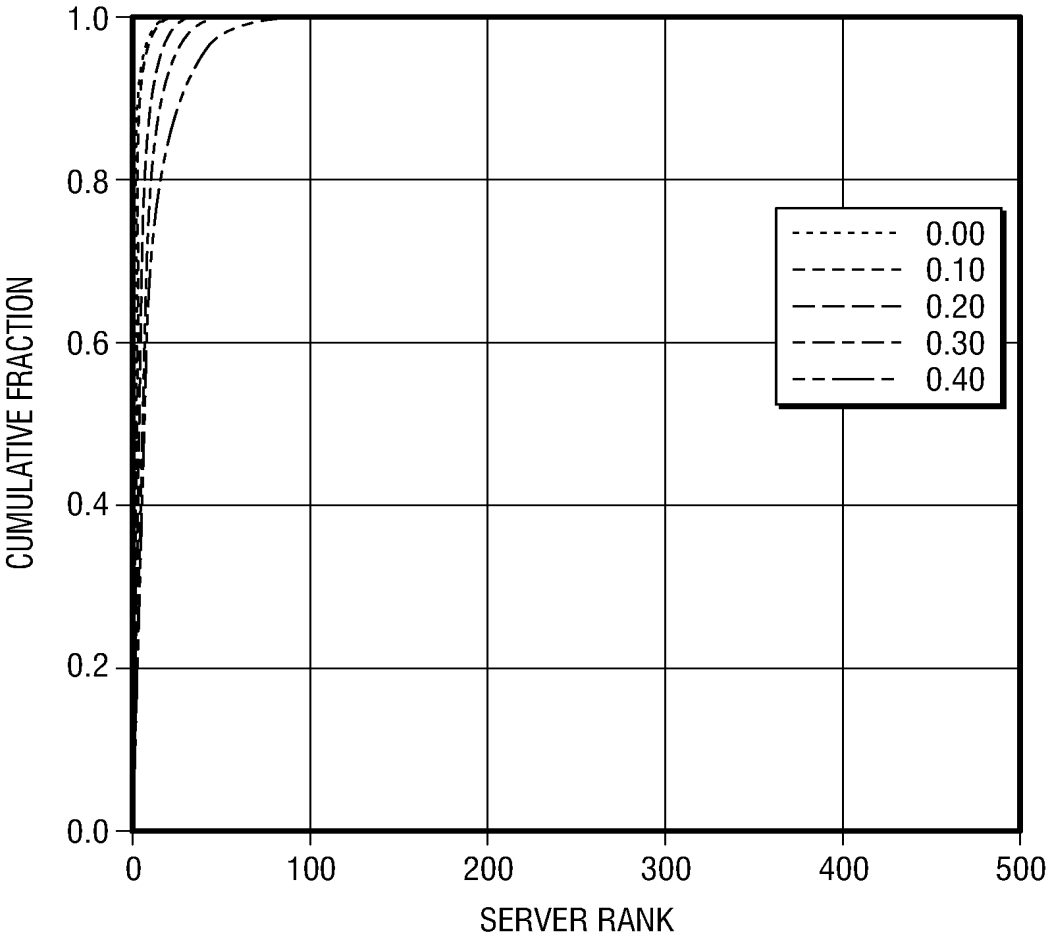
MINIMALIST ROUTING PERFORMANCE ON 1,000 SERVERS, ROUND 1
(PACKET LOSS RATES BETWEEN 0.00 AND 0.40)

FIG. 8



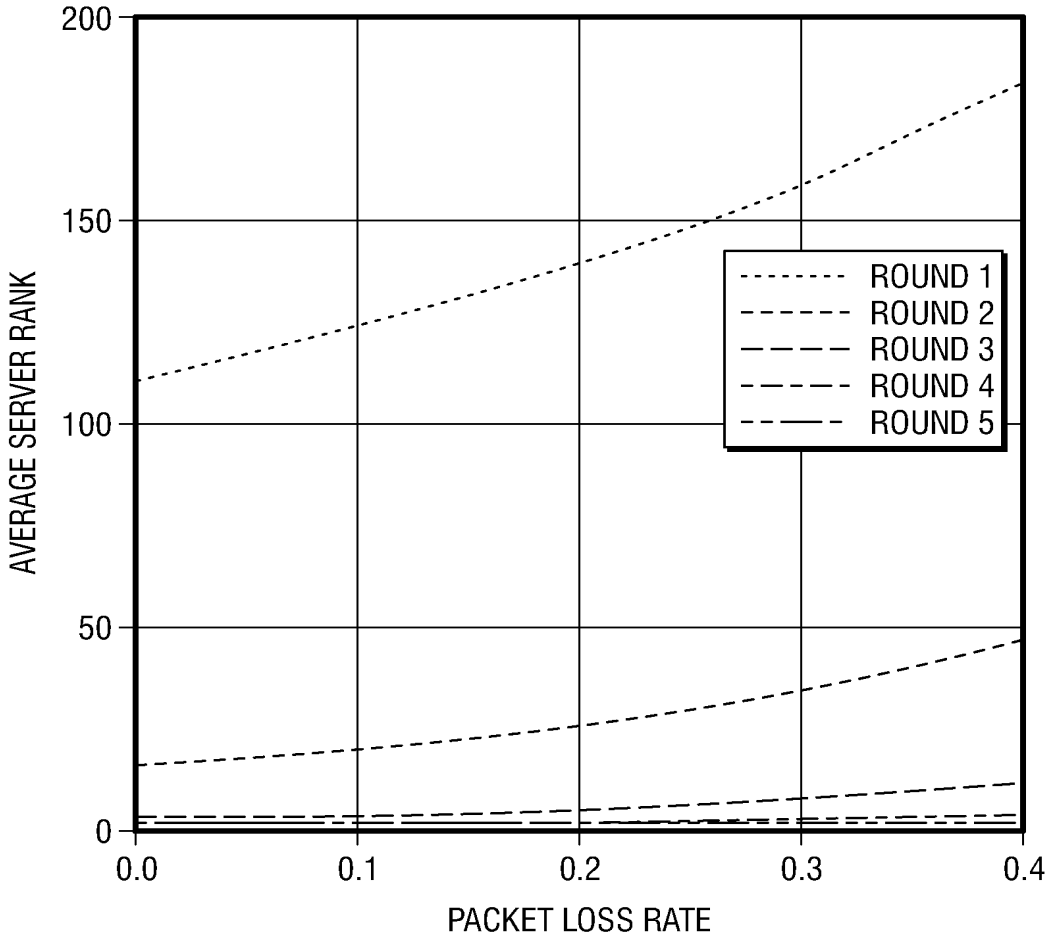
MINIMALIST ROUTING PERFORMANCE ON 1,000 SERVERS, ROUND 2
(PACKET LOSS RATES BETWEEN 0.00 AND 0.40)

FIG. 9



MINIMALIST ROUTING PERFORMANCE ON 1,000 SERVERS, ROUND 3
(PACKET LOSS RATES BETWEEN 0.00 AND 0.40)

FIG. 10



MINIMALIST ROUTING PERFORMANCE ON 1,000 SERVERS,
AVERAGE SERVER RANK AS A FUNCTION OF PACKET LOSS RATE

FIG. 11